Master's/Bachelor thesis project:
Assessing the phenological flexibility of trees to cope with stress

The Temporal Ecology Lab in the Department for Forest and Conservation Sciences at UBC (Vancouver, Canada) is looking for a student (MSc, first year PhD or motivated undergraduate, including Co-op students) in the project "PhaenoFlex" to study the ability of temperate forest trees to shift and divide their phenological cycle in response to environmental stressors.

Background: Increasing temperatures through anthropogenic global warming have advanced spring phenology over the last decades. Moreover, drought events during the growing season have increased in intensity and frequency in many regions worldwide. Both of these trends require trees to adapt considerably in order to perform their annual cycle within the window of opportunity that presents itself. Depending on the temporal occurrence of critical water shortages tree species are affected at different stages of their seasonal developmental. Thus, susceptibility at a particular stage and/or flexibility to shift developmental and growth activities determine whether the same stressor can lead to mortality or only minor growth reductions.

Aim: To identify the potential of temperate tree species to cope with an environmental stressor by optimally filling the available 'time window of opportunity' (e.g. by shifting or splitting the phenological development and growth activity around a drought or frost period). Students working on the project will gain skills in climate change and plant physiological science while working in a multidisciplinary research team.

Method: Within an experimental framework we will artificially expose saplings to a moving window of artificial stress (i.e. drought applied in a climate chamber) and monitor key phenological traits (leaf-out, budset, senescence) as well as activity patterns of the radial and apical meristems. Image analysis of micro stem slices reveal the progress of xylogenesis.

Starting date: Ideally February/March 2023

WSL-Swiss Federal Institute for Forest, Snow and Landscape Research
Zürcherstrasse 111, CH-8903 Birmensdorf, Telefon +41 44-739 21 11, www.wsl.ch

Languages: English/German/French.

For more information, contact Prof Dr. Elizabeth Wolkovich (e.wolkovich@ubc.ca) and/or Frederik Baumgarten (frederik.baumgarten@protonmail.ch).